

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 664166	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2004/000192	International filing date (day/month/year) 14-01-2004	Priority date (day/month/year) 14-01-2003
International Patent Classification (IPC) or national classification and IPC F02D 13/02, 15/04		
Applicant YANMAR CO., LTD.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.	
2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.	
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersedes earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).	
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/ Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/000192

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☐ the international application in the language in which it was filed
- ☐ the translation of the international application into _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rule 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/000192

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-9	NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: JP 2002-188474 A (Mazda Motor Corp.), 5 July 2002, entire text; fig. 7 (Family: none)

Document 2: JP 11-257108 A (Hitachi, Ltd.), 21 September 1999, entire text; fig. 8, 9 & US 2002-11233 A1

Document 3: JP 7-259655 A (Komatsu Ltd.), 9 October 1995, Par. Nos. [0020], [0021]; fig. 8, 9 & US 5682854 A1

Document 4: Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 16284/1985 (Laid-open No. 132434/1986) (Mitsubishi Motors Corp.), 19 August 1986, entire text; all drawings

Document 5: JP 11-210539 A (Toyota Motor Corp.), 03 August 1999, paragraph [0070]; fig. 14 & US 6293246 B1

Claims 1, 2 and 4

Document 1

A method for controlling a premix compression self-igniting internal combustion engine wherein the effective

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

compression ratio is altered by temporarily re-opening the exhaust valve during the compression process and a method for controlling a premix compression self-igniting internal combustion engine wherein the effective compression ratio is altered to that at which the most suitable self-igniting time is obtained for each operation region by modifying the closure period of the valve that is opened during the compression process are disclosed in document 1 and it would be easy for a person skilled in the art to conceive of altering the closure timing of the valve which is re-opened.

Claims 3 and 6

Documents 1 and 2

Document 2 cited in the international search report discloses a map prepared according to engine revolutions and load and a method for controlling compression self-igniting internal combustion engine wherein, when the suction temperature is high, the effective compression ratio is low and when the suction temperature is low, the effective compression ratio is high.

Claim 5

Documents 1 and 3

Document 3 cited in the international search report discloses a method for controlling a compression self-igniting internal combustion engine wherein the effective compression ratio is increased in those operation regions in which the EGR is high and the effective compression ratio is reduced in those operation regions in which the EGR is low.

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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Claim 7

Documents 1 and 4

Document 4 cited in the international search report discloses a method for controlling a compression self-igniting internal combustion engine wherein the effective compression ratio is low when the cooling water temperature is high and the effective compression ratio is increased when the cooling water temperature is low.

Claims 8 and 9

Documents 1, 2, 3, 4 and 5

Document 5 cited in the international search report discloses a method for controlling a compression self-igniting internal combustion engine wherein the closure timing of the valve which is open during the compression process is delayed during periods of irregular combustion.